INSTITUTE OF PUBLIC HEALTH
COLLEGE OF MEDICINE AND HEALTH SCIENCES
UNIVERSITY OF GONDAR

Prevalence and Associated Factors of Hypertension among Adults of Gondar Town, North West Ethiopia

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List of Acronyms

AOR	Adjusted Odds Ratio
BMI	Body Mass Index
BP	Blood Pressure
CI	Confidence Interval
CSA	Central Statistical Agency
DBP	Diastolic Blood Pressure
DM	Diabetes Mellitus
DSS	Demographic Surveillance Site
ETB	Ethiopian Birr
IQR	Inter Quartile Range
KG	Kilogram
mmHG	millimeter mercury
NCD	Non Communicable Diseases
OR	Odds Ration
SBP	Systolic Blood Pressure
SD	Standard Deviation
SSA	Sub-Saharan Africa
STEPS	World Health Organization stepwise approach to chronic disease risk factor surveillance
USA	United States of America
WHO	World Health Organization

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Abstract

Introduction: The prevention and control of high blood pressure has not received due attention in many developing countries. Hypertension is a growing public health problem in Africa and particularly in Ethiopia.

Objectives: The study was aimed to determine prevalence and associated factors of hypertension among adults of Gondar town, North West Ethiopia

Methods and materials: community based cross-sectional study was conducted in April, 2012 in Gondar town. Data were collected by face to face interview using a pretested and structured questionnaire from 679 adults selected by multi-stage sampling technique after verbal informed consent. Measurements on weight and height were taken using standard digital beam balance and tape meter. Hypertension was defined as BP ≥140/90mmHG or reported use of regular anti-hypertensive medication. BP was measured in a sitting position using standard mercury sphygmomanometer BP cuff after the study participant rested for at least five minutes and no smoking or caffeine 30 minutes before measurement. Binary logistic regression was fitted and OR with 95% confidence interval and p-value were calculated to identify associated factors.

Results: - the over all response rate was about 97.6%. Fifty two percent of respondents were females and about 21% were ≥ 65 years old and 5.6 % were obese. Of the total 679 study participants, 28.3% were hypertensive and about 37% of were not aware of that they had hypertension. Factors found to be associated with hypertension were: family history of hypertension AOR = 2.82, obesity AOR = 5.77, self reported DM (AOR = 3.92), age category of 55-64years (AOR = 2.07), age category of ≥ 65 years (AOR=4.87).

Conclusion and recommendation: - the prevalence of hypertension in this community was high and may indicate a hidden epidemic in this community. Community based screening programs need to be designed for chronic diseases like hypertension especially for those aged 55 years and above, obese and has family history of hypertension.

Key words: Hypertension, prevalence, community based study, Gondar

1. Introduction

1.1. Statement of the problem

High blood pressure, or hypertension as the disease is known medically, is our most common chronic illness .Blood pressure is low when we are resting or asleep, and higher when we are moving about or under stress. In more than 90% of the cases, we do not really know what causes hypertension. However, High blood pressure may cause: the heart to get larger, little blisters (aneurysms) in the blood vessels in the brain, Progressive narrowing of the kidney blood vessels, and increased rate of hardening of the arteries all over the body, especially in the heart, brain, and kidneys(1, 2)

According to the Global status report on Non Communicable Diseases (NCDs) and Global Health Risks, raised blood pressure is estimated to cause 7.5 million deaths, about 12.8% of all deaths. The prevalence of raised blood pressure is similar across all income groups, though it is generally lowest in high-income populations.(3, 4)

Hypertension doubles the risk of cardiovascular diseases, including coronary heart disease (CHD), congestive heart failure (CHF), ischemic and hemorrhagic stroke, renal failure, and peripheral arterial disease. Blood pressure levels, the rate of age-related blood pressure increase, and the prevalence of hypertension vary among countries and among subpopulations within a country(5). According to WHO Regional Office for Africa, the prevalence of hypertension was found to be rapidly increasing, from 3% in rural areas to 30% in some urban settings. In some populations, hypertension prevalence rates were higher in women than in men while the opposite was true in others. Most people with hypertension were not aware of their condition, and of those who were on treatment, only 20% had optimal control (6, 7).

The prevention and control of hypertension has not received due attention in many developing countries. Although it is one of the most modifiable risk factors for cardiovascular diseases, awareness, treatment and control of hypertension is extremely low in these countries, as health care resources are overwhelmed by other priorities including HIV/AIDS, tuberculosis, and malaria(8).Both lower-income groups (because of socioeconomic stress, lack of access to facilities, and poor diet) and higher income

groups (because of obesity, dietary excess, alcohol consumption, and lack of exercise) may be at increased risk of developing hypertension(9).

There are few studies done in Sub-Saharan Africa (SSA) generally show high prevalence of hypertension. Urban populations consistently had higher prevalence of hypertension compared with their rural counterparts in almost all studies that covered both types of area(10).

The magnitude of the problem is not clearly known in Ethiopia and particularly in the study area .However clinical experts indicated that the problem is rising because of the increase in risk factors like smoking, obesity, harmful use of alcohol and lack of exercise etc(11).

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1.2. Literature review

A systemic review made globally summarizes as, 26·4% of the adult population in 2000 had hypertension (26·6% of men and 26·1% of women(12). A National Health and Nutrition Examination Survey (NHANES) was conducted by the National Center for Health Statistics of the Centers for Disease Control and Prevention in USA showed that the prevalence of hypertension in 2003–2004 was 32.6 and 66.3 in the, 40 to 59, and ≥60 age groups, respectively. The overall prevalence was 29.3% (13).

A community based survey in Jordan revealed that 32.2% were categorized as having hypertension and an other descriptive cross sectional study with at total sample size of 792 from same country estimated the overall hypertension prevalence to be 28.3%(14, 15).

In a community based cross sectional study in northern India, the prevalence of hypertension was 32.8% in the urban population and 14.5% in the rural population (16).

A systemic review in SSA showed that prevalence of hypertension was higher in urban than rural studies in all studies that covered both types of area, and also increased with increasing age in most studies. In most studies less than 40% of people with blood pressure above the defined normal range had been previously detected as hypertensive. Hypertension is of public health importance in SSA, particularly in urban areas, with evidence of considerable under-diagnosis, treatment, and control(10).

A community based cross sectional study done on 218 rural 18 and above years old study participants ,in rural Nigeria noted that overall high blood pressure prevalence rate of 44.5%(17). An other community based cross sectional study on 3323 study subjects of both rural and urban areas of Mozambique estimated the prevalence of hypertension to be 33.1% (women: 31.2%; men: 35.7%)(18).

A multi-country project for surveillance of risk factor for NCDs in Ethiopia, Vietnam and Indonesia, a cross-sectional study identified BMI along with sex and age were found to be significant determinants of hypertension across the three study areas. The odds of hypertension were more than sevenfold among overweight and obese individuals in Indonesia. The risk of hypertension was also significantly higher at BMI ≥25 kg/m2 in Ethiopia and Vietnam. The odds of hypertension rose steadily with age across the three

populations. Age groups 45–54 and 55–64 years had significantly higher odds of hypertension compared to the youngest age group 25–34 years(19).

A cross sectional study done on 2000 study subjects of rural community of Vietnam showed 14.1%.of study subjects were hypertensive. Men were hypertensive more often than women and age was positively associated with hypertension. Among men, those with lower educational and occupational status but who were richer were more likely to be hypertensive(20).

In many community based cross sectional studies a significant association of blood pressure with increasing age was seen (15, 21-23). In urban areas, hypertensive were less physically active, diabetics and more likely to smoke and consume alcohol. Mean weight, and BMI of hypertensives were significantly higher (16). A cross sectional study conducted in 792 Chechens and Circassians study participants In Jordan, the overall prevalence rate of hypertension was 23.9%. Risk factors for hypertension were: family history, female gender, and older age however, Risky behaviors, including smoking and physical inactivity, were found to be statistically insignificant(15)

A 20 years longitudinal study of coronary artery disease risk factors in 5115 young African-American and European-American participants of both sexes found that race, gender, older age, family history of hypertension, body mass index, income, and Education, were associated with hypertension(22).

A prospective cohort study done in Boston, Massachusetts among 28,236 women in that Cigarette smoking was modestly associated with an increased risk of developing Hypertension, with an effect that was strongest among women smoking at least 15 cigarettes per day(24).

A cross-sectional, population-based household survey in Barbados (western India) showed that alcohol consumption, Obesity and diabetes were associated with hypertension in both genders(21, 25).A community based study in Uganda found a higher prevalence of hypertension and past and present alcohol use, being overweight , obese, female sex, and having attained tertiary education were found to be significantly associated with hypertension(26).

An other community based study done on 2352 study subjects in Eritrea showed the prevalence of hypertension was 15.9% in the general population, with 16.4% in urban

and 14.5% in rural areas. BMI was positively associated with systolic (SBP), diastolic and mean arterial pressure. The effect of BMI on BP was higher in males than in females especially in those >45 years. BMI and age appear to play a synergistic role in creating a strong association with BP(27).

In Ethiopia one community based study done in Addis Ababa city on 3713 study participants in the age group of 25-64 showed the age-adjusted prevalence of high blood pressure, was 31.5% among males and 28.9% among females.(8).

An other Similar study done in this country, southern Ethiopia, the overall prevalence of hypertension was 9.9% with 10.1% in urban and 9.7% in rural areas ranging from 4.2% in those below 30 years to 29.4% in those above 60 years. In this study the likelihood of hypertension was higher in those above 30 years old, in those with the family history of hypertension, and a BMI > or =25 kg/m2. In addition to this hypertension was highly associated with less physical activity, , excess meat consumption (21).

In a Hospital based study conducted among diabetes patients at Jimma university hospital revealed that almost half of them were hypertensive (46.5%).In this paper independent factors like age ≥ 45 years, type 2 diabetes and obesity were predictors of hypertension(28).

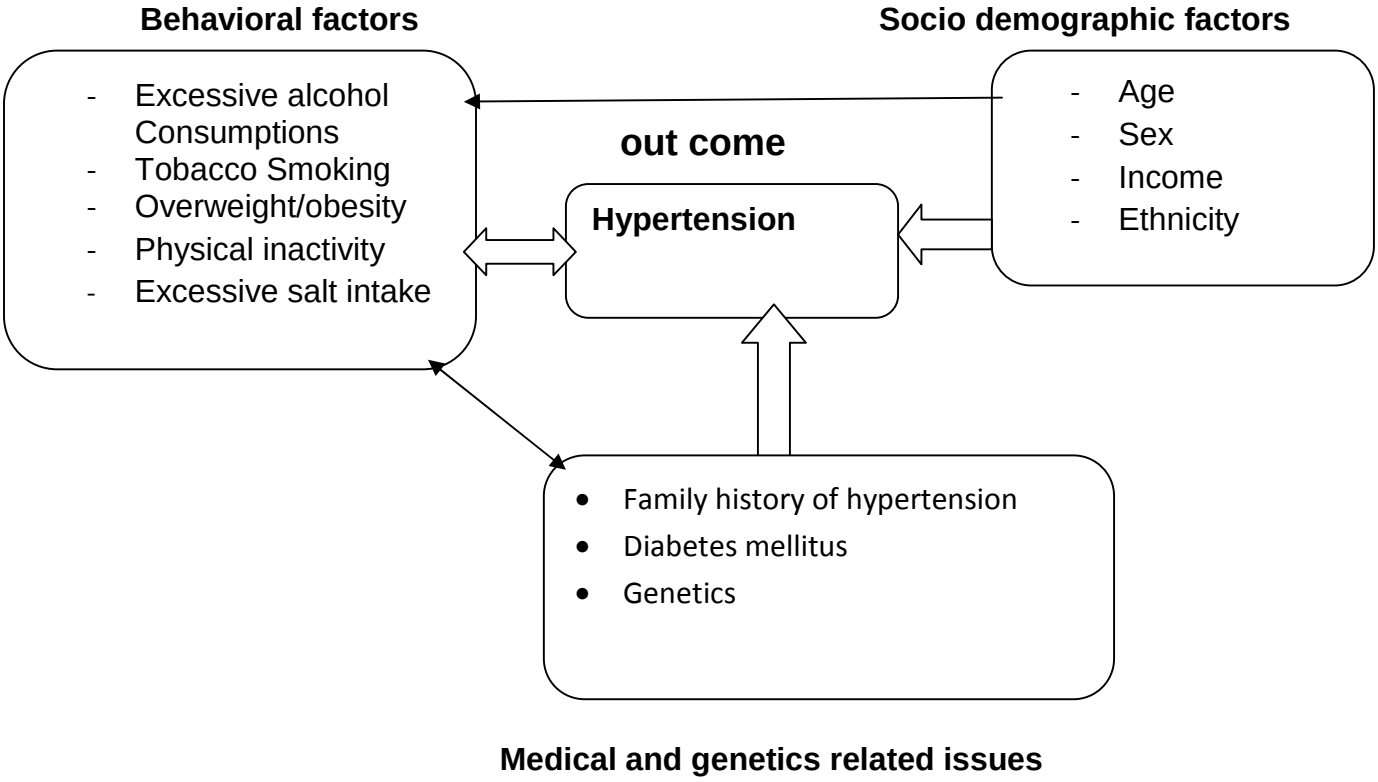


Fig 1:- Conceptual frame work of hypertension in Gondar town, North West Ethiopia April 2012

1.3. Justification of the study

Hypertension is an important worldwide public-health challenge because of its high prevalence and concomitant risks of cardiovascular and kidney diseases. It has been identified as the leading risk factor for mortality, and is ranked third as a cause of disability-adjusted life-years. The prevalence of hypertension in various regions of the world has been widely reported; however, there are few studies in our country and no study has been done in the study area.

People who have hypertension are usually unaware that they have the condition, unless the BP has been measured at health-care facilities. Hence, one of the most important aspects of preventive cardiology should be to identify as many people who have the disease as possible and to take steps to lower the blood pressure before it causes damage to the blood vessels, heart, kidneys, eyes, and other organs.

Furthermore, for prevention and treatment of such highly idiopathic disease, it is very important to know associated factors and apply some preventive modalities before the occurrence of the disease and its complications.

Therefore, it is high time to conduct such a study in this country and in particular in the study area. It will be helpful for health workers and policy makers in designing prevention, priority setting and resources allocation.

2. Objectives

2.1. General objective

To assess the prevalence and associated factors of hypertension among adults of Gondar town, North West Ethiopia, April 2012

2. 2. Specific objectives

- To determine the prevalence of hypertension among adult of Gondar town
- To identify factors associated with hypertension among adult of Gondar town

3. Methods

3.1. Study design and period

A community based cross sectional study was conducted from April 01-30/ 2012 in Gondar town.

3.2. Study Area

The study area was Gondar town which is located 750 kilometers, North West from the capital city of Addis Ababa. According to the recent administration, the town has 12 administration areas which consisted of 21 kebeles. Gondar is one of the ancient and densely populated towns in Ethiopian. Nowadays the town is growing and has five health centers and one referral hospital serving the population of the town and out side. According to 2007 CSA, the town had an estimated population size of 206,987(98,085 and the rest were females)(29). But according to the recent(2011) Gondar town health office report, the estimated population size was about 209,163(30)

3.3. Source and study population

The source population for this study was all adults of age 35 and above who are living in Gondar town. The study population was all adults in the administrative areas who had chance to be selected. The study unit was adults in the sampled kebele who were eligible and gave verbal consent to participate.

3.4. Inclusion and exclusion criteria

Inclusion: permanent residents (who lived in the area for 6 months and more) of age 35 years old and above in the selected houses were interviewed.

Exclusion: pregnant ladies whose pregnancy was visible were excluded from the study.

3.5. Variables of the study

3.5.1. Dependant variable

- Hypertension status

3.5.2. Independent variables

- Socio demography characteristics (sex, age, educational level, marital status, monthly income, occupation, religion and ethnicity.)
- Smoking habit (current or previous)
- Excessive alcohol intake (current or previous)
- Body mass index
- DM status
- Family history of hypertension
- Physical activity
- Dietary habit (excessive salt, saturated fat, vegetable & fruit consumptions)

3.6. Operational definitions

Hypertension: Hypertension is sustained high blood pressure (≥140/90mmHg)(4).

BMI= weight in Kg/ (Height in meter) ^{2}

BMI (kg/m^2)	Weight status
Below 18.5	under weight
18.5 - 24.99	Normal
25 - 29.99	Overweight
≥30	Obese

3.7. Sample size and sampling procedure

3.7.1. Sample size determination

The sample size (n) was determined using the formula for single population proportion:

$n = \frac{z^2_{\alpha/2} xP(1-P)}{w^2}$ and with the following assumptions

- A study done in Addis Ababa city (2008) the prevalence of hypertension was 31.5% and 28.9% for males and females respectively(8) taking (**P** =**0.315**) which gave lager sample size.
- **95% confidence interval ,a 5%margin of error**
- **5%** was assumed for possible non response during the actual data collection.
- Because of multiple stage sampling considering **two stages**

The total sample size was:

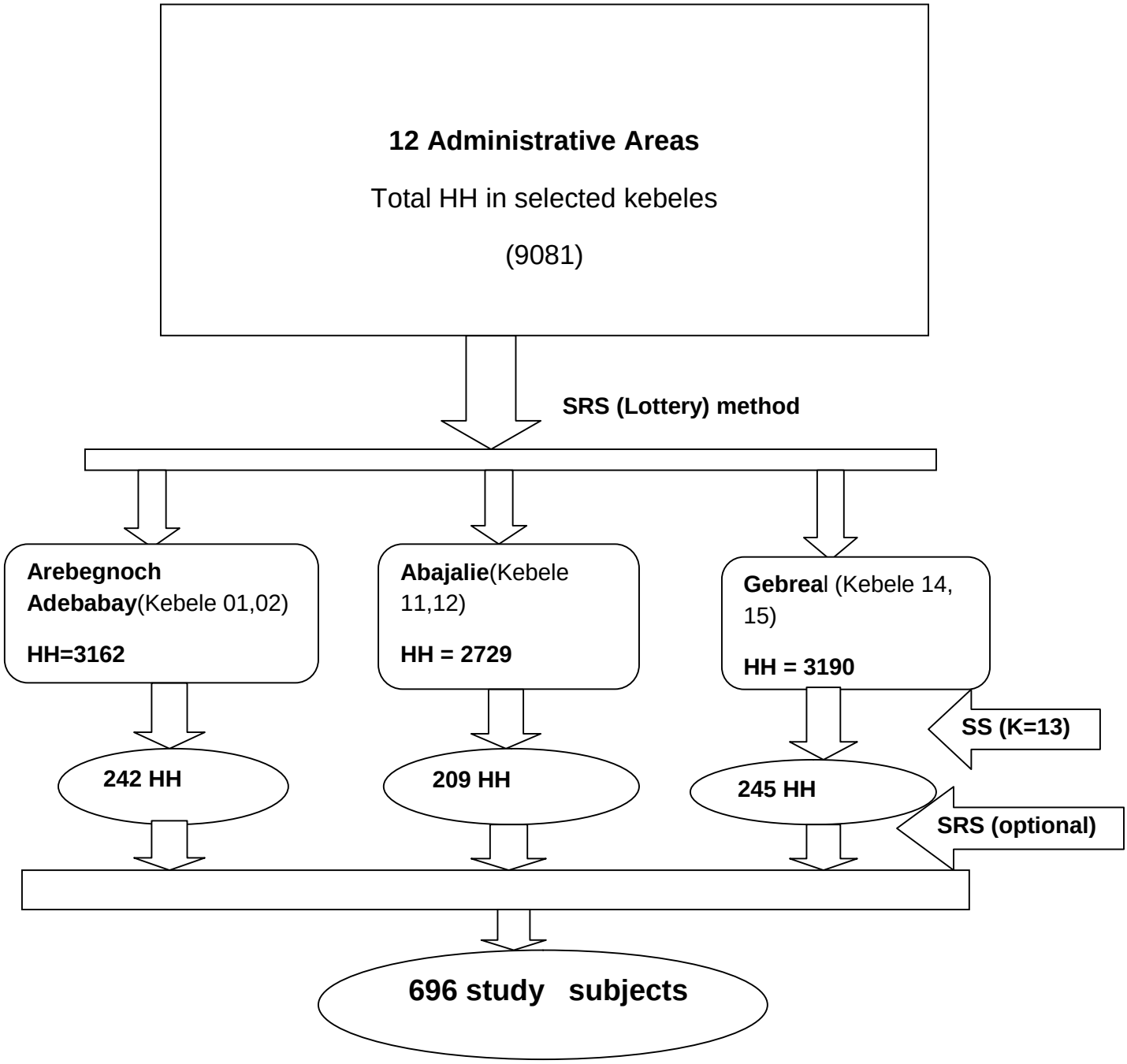
$n = \frac{Z^2\ \alpha/2xP(1-P)}{w^2} = \frac{(1.96)^2(0.315)\ (0.685)}{(0.05)^2}$ = (331.5 + 5 %(331.5)) x2 = **696 subjects**

Hence, the final sample size (n) was **696**

3.7.2. Sampling procedure

Multistage sampling technique was used to select the study participants. In the first step, of the 12 administrative areas of Gondar town 3 administrative areas (20 % of the total area) were selected randomly by lottery method. In the second stage a total of 696 households were selected using a systematic random sampling method. In this process samples were proportionally allocated to each selected administrative area. Total number of households was obtained from the respective administrative areas and used to calculate the sampling fraction. The initial household to be interviewed was randomly selected by lottery method and the next was selected every 13^{th} house (see figure 2 below).

Only one individual who fulfill the inclusion criteria was interviewed from the selected household. Occasionally, two or more individuals who fulfill the inclusion criteria were available in the selected houses in which case lottery method was applied. Some people were absent from the household during the day of data collection, as a result she/he was interviewed through revisit otherwise the next house was considered.



SRS = Simple random sampling SS = Systematic sampling (K =9081/677 = 13th)

K= sampling fraction HH = Households

Fig 2:-Diagrammatic representation of the sampling procedure, Gondar, Ethiopia April 2012

3.8. Data Collection Instruments and Procedure

The questionnaire was first prepared in English and then translated in to the local language, Amharic and back to English by 2 different individuals to check for consistency and conceptual similarity among the survey teams.

One supervisor, principal investigator and 6 data collectors (nurses) were recruited and trained for two days by the principal investigator on how to do sampling, the basic skills of interview and measurements particularly height, BP and weight, ways of obtaining verbal consent and other precautions. The principal investigator supervised and coordinated activities of the data collection process.

The WHO STEPS instrument(31) was used to collect data on selected behavioral and lifestyle characteristics including, physical activity, and physical measurements of weight, height, as well as blood pressure. Weight was measured with participants standing without shoes and wearing light clothing. Height was measured at standing upright with the head in Frankfort plane. Body-mass index (BMI) was calculated as weight in kilograms over height in meters squared [weight (kg)/ (height (m)) ^{2}].

Blood pressure was measured in a sitting position using standard adult cuff size mercury sphygmomanometer BP cuff which covers two-thirds of the upper arm after the study participant rested for at least five minutes and no smoking or caffeine 30 minutes before measurement. The cuff was inflated at a rate of 2- 3mmHg per second. Systolic blood pressure (SBP) was taken upon hearing the first sound, and diastolic blood pressure (DBP) was taken upon complete disappearance of Korotkoff sounds (phase V). Two consecutive measurements were made in an interval of 5 minutes and the mean was determined from these two measurements.

3.9. Data quality assurance

To maintain the quality of data obtained, data collectors were trained and assessed for their level of understanding on the approaches and the contents of the questionnaire before the actual data collection. Data collectors were recruited out side of the study population, to avoid familiarization with the respondents that may affect certainty of the responses. The principal investigator made on site supervision during the whole period of data collection. Daily check up was done on completed questionnaire during submission. Definition of concepts and terms were made clear to avoid ambiguity during pretest and training. Finally double entry was made on 5% of questionnaires to check consistency and errors.

Pretest

The Amharic version questionnaire was pretested on 35 individuals found outside of the sampled kebeles in Gondar town, as a result the acceptability, applicability of procedures and tools were tested. Some revisions were made on the questionnaire after the pretest.

3.10. Data management and analysis

3.10.1. Data management

Each completed questionnaire was checked visually for completeness before fed to computer. Then data was entered to EPI INFO version 3.5.3 and clean up was made to check accuracy, consistency and any error identified was corrected. Finally data was exported to SPSS version 20 and further clean up and recoding was done.

3.10.2. Data analysis

Analysis of data was done using SPSS version 20**.** Descriptive statistics like frequencies and cross tabulation were performed. Crude and adjusted odds ratios with 95% confidence interval were used to determine the strength of association between dependent and independent variables. P value ≤ 0.05 was considered as significant.

Moreover, binary logistic regression was used to asses association between the dependent variable and each independent variable and those whose p values less than or equal to 0.2 was fitted to multiple logistic regression so as to assess the strength of association and control confounding.

4. Ethical consideration

Ethical clearance was obtained from the University of Gondar, institute of public health. Permission letter was obtained from Gondar city administration office .Respondents were fully informed about the purpose of the study and the interview was held only with those who gave verbal consent to participate. The right of participant to withdraw from the study at any time, with out precondition was kept, and disclosed to participants. Interviews were anonymously conducted at the respondent's home or in another private place chosen by the respondents. Confidentiality of the information was assured from all the data collectors and principal investigators side via using code numbers than personal identifiers names and keeping questionnaires locked. Those participants who had hypertension were advised to visit the nearby health facility for further diagnosis and treatment.

5. Results

A total of 679 adults (with a response rate of 97.6%) were included in this study. Three hundred fifty six (52.4%) were females. The median age was 50 years (with IQR 38-60 years). Majority (81.8%) were orthodox Christians and Amhara (73.9%) ethnic group. Nearly half of them (52.3%) were married, and about 16% did not have formal education. Nearly one third of them (35.3%) were house wives. One hundred eighty seven (27.5%) were earning between1301 and 2000 ETB per month (Table1).

Table 1:- Socio-demographic characteristics of the study participants in Gondar town, North West Ethiopia, May 2012(n= 679)

Characteristics	Frequency	Percent
Sex		
Male	323	47.6
Female	356	52.4
Age		
35-44	263	38.7
45-54	162	23.9
55-64	109	16.1
>=65	145	21.4
Marital status		
Single	73	10.8
Married	355	52.3
Divorced	106	15.6
Widowed	145	21.4
Education level		
No formal education	245	16.1
Primary level	157	23.1
Secondary level	172	25.3
Tertiary level	105	15.5
Occupation		
Government employed	107	15.8
Merchant	127	18.7
Daily laborer	98	14.4
House wife	240	35.3
Retired	70	10.3
*Others	37	5.4
Religion		
Orthodox	556	81.9
Muslim	112	16.5
Protestant	7	1
**Others	4	0.6
Ethnicity		
Amhara	569	83.8
Tgrie	62	9.1
Kimant	40	5.9
Others	8	1.2
Monthly income		
≤ 750	173	25.5
751-1300	165	24.3
1301-2000	187	27.5
>2000	154	22.7

***= 18 drivers &19 farmers **= 3 Catholics & 1 non religion follower

Behavioral Characteristics of Respondents

From participants only 19(2.8%) were current smokers of which 12(63.2%) smoke less than 10 cigarettes per day while the rest smoke more than half packet (10) cigarettes per day. Some 32(4.7%) of the respondents were previous smokers and 17(53.1%) of them were heaver smokers (smoked greater than half a packet per day).

Concerning harmful use of alcohol, out of the total study subjects 251(37%) were current alcohol users and 68(10%) were previous users of alcohol.

With regard to physical activities of the respondents less than one fourth of respondents 115(16.9%) involved in vigorous activities like carrying or lifting heavy loads, digging or construction work, though only 24(20.9%) of them were doing vigorous activities daily. On the other hand, most of the participants 645(95%) walk at least for 10 minutes continuously per day and 479(74.3%) of them walk at least for 10 minutes continuously the whole days of a week. Almost three quarter, 552(76.9%) of participants reported that they usually used vehicle to travel to their work place and other places (Table2).

Dietary habits of respondents

Majority 460 (67.7%) of respondents were using vegetable/sold oil for their usual meal preparation.

Half of the respondents, 340(50.1%), did not eat fruits in any days of a week and only 22(3.2%) of the respondents reported that they have eaten fruits in 4 or more days of a week. More than half of the participants 459(67.6%) reported that they have consumed vegetables at least 1 to 3 days in a week. On the other hand only 134(19.7%) of respondents reported that they haven’t eaten any vegetable in any days of a week. About 143(21.1%) of respondents have reported excessive use of salt other than the family (Table 2).

Table 2: Hypertension prevalence across behavioral and dietary related characteristics of respondents in Gondar town (N= 679) May, 2012

Characteristics	N	Percent	HTN prevalence (%)
Cigarette smoking status			
Never	628	92.5	28.8
Current	19	2.8	15.8
Previously	32	4.7	25
Alcohol use			
Never	360	53	28.9
Current	251	37	24.3
Previous	68	16	39.7
Commonly used oil/fat			
Saturated oil	460	67.7	27.2
Sesame/nug oil	212	31.2	31.1
Others	7	1.0	14.3
Fruit consumption/week			
None	340	50.1	28.8
1-3days	317	46.7	28.1
4-7days	22	3.2	22.7
Vegetable use/week			
None	134	19.7	34.3
1-3days	459	67.6	24.4
4-7days	86	12.7	39.5
Excessive salt			
Yes	143	21.1	33.6
No	536	78.9	26.9
Vigorous work/week			
None	564	83.1	29.6
1-3	33	4.9	18.2
4-7	82	12.0	23.2
Walking status			
None	34	5	55.9
Daily	479	70.5	30.5
<daily/wk	166	24	25.7
Transportation			
Use vehicle	522	76.9	29.9
On foot	157	23.1	27.8
Diabetes status			
Yes	47	6.9	66
No	632	93.1	25.5
Family History of HTN			
Yes	81	11.9	44.4
No	598	88.1	26.1

BMI of respondents

The mean BMI of respondents was 23.35(±4.02 SD). More than half of the respondents 399(58.8%) were in the normal range of BMI, 172(25.3%) were overweight, 70(10.3%) were under weight and only 38(5.6%) of them were obese.

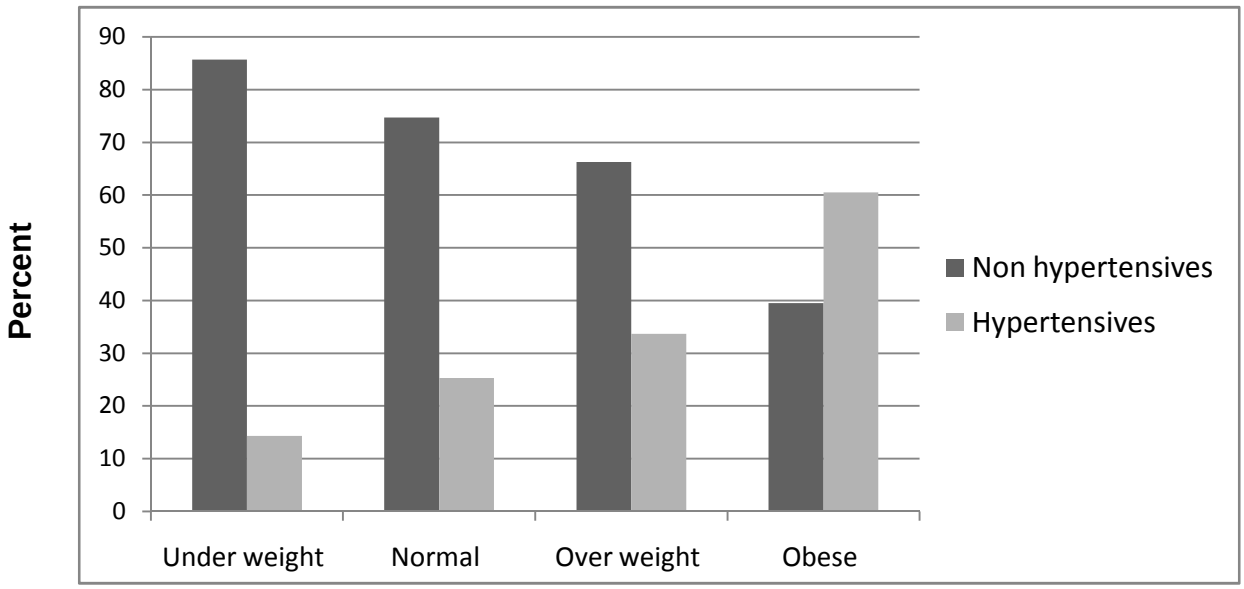


Fig 3: Bar graph showing prevalence of hypertension across BMI groups of respondents in Gondar town, North West Ethiopia may 2012

Prevalence, treatment and control of hypertension

The mean systolic and diastolic BP were 120.2mmHg (±19.6 SD) and 72.4 mmHg (±10.5 SD). The over all prevalence of hypertension was 192 {28.3 %(95% CI: 24.9-31.7)}, slightly lower in men (26%) than women (30.3%) though the difference was not significant (P *value*= 0.211). Among the hypertensive study participants 71(36.98%) of them were not aware of that they had hypertension. More than half 121(63.02%) of the hypertensive subjects were treated pharmacologically and only 51(42.15%) of them had normal BP during data collection.

Factors associated with Hypertension

The effect of age, education level, marital status, occupation, self reported DM, BMI, family history of hypertension, walking daily at least for 10 minutes continuously, current alcohol use, previous alcohol use, vegetable use, excessive salt use and vagarious work on hypertension were assessed using both bivariate and multivariate logistic regression analysis. On bivariate analysis age category of 45-54 years old and above age categories, widowed, house wives, retired, overweight, obese, self reported DM, family history of hypertension, secondary and above level of education, vegetables consumption of 1-3 days/week, underweight and walking at least 10 minutes continuously per day were significantly associated with hypertension.

In multivariate analysis, family history of hypertension, obesity, self reported DM, age group of 55-64 years and age group of 65 years and above were independently and significantly associated with hypertension.

Being obese was significantly associated with hypertension, with an AOR of 5.77[95%CI: 2.27-9.01], compared to subjects with BMI of normal range.

Age and family history of hypertension, non-modifiable factors, were found to be associated with hypertension. The likelihood of hypertension increased with advancing age. Among subjects aged 55-64 years, the AOR was 2.07 [95%CI: 1.03-4.16], whereas the AOR in subjects aged 65 and above was 4.87 [95%CI: 2.55-9.28], both compared to subjects aged 35-44 years. Those who had family history of hypertension, AOR= 2.82[95%CI, 1.42-5.59], were at higher risk of hypertension. Self reported DM participants were more likely to be hypertensive compared to their counter part, with an AOR=3.92 [95%CI 1.65-9.31]. Risky behaviors, including smoking and harmful use of alcohol, were found to be statistically insignificant (Table 3).

Table 3:- Bivariate and multivariate logistic regression analysis of factors associated with Hypertension among study participants in Gondar town (n=679), May 2012

Variables	HTN		Crude OR	Adjusted OR
	Yes	no	(95% CI)	(95% CI)
Age				
35-44	41	222	1.00	1.00
45-54	39	123	1.72(1.02-2.89)*	1.42 (0.74-2.71)
55-64	35	74	2.56(1.52-4.32)*	2.07(1.03-4.16)*
≥ 65	77	68	6.13(3.85-9.77)*	4.87(2.55-9.28)*
Education level				
No formal education	85	160	1.00	1.00
Primary level	43	114	0.71(0.46-1.10)	0.61(0.31-1.22)
Secondary	41	131	0.59(0.38-0.91)*	0.89(0.44-1.81)
Tertiary	23	82	0.53(0.31-0.89)*	0.85(0.34-2.11)
Marital status				
Single	21	52	1.00	1.00
Married	83	272	0.76(.43-1.33)	0.53(0.23-1.24)
Divorced	23	83	0.69(.35-1.36)	0.52(0.20-1.38)
Widowed	65	80	2.01(1.10-3.68)*	0.77(0.31-1.89)
Occupation				
Government employed	22	85	1.00	1.00
Merchant	28	99	1.09(0.58-2.05)	1.02(0.37-2.85)
Daily laborer	17	81	0.81(0.40-1.64)	1.18(0.37-3.76)
House wife	87	153	2.20(1.28-3.76)*	1.33(0.52-3.44)
Retired	28	42	2.58(1.32-5.03)*	0.92(0.29-2.90)
**Others	10	27	1.43(0.60-3.39)	1.05(0.21-5.13)
BMI				
normal	101	298	1.00	1.00
underweight	10	60	0.49(0.24-0.99)*	0.50(0.22-1.17)
overweight	58	114	1.50(1.02-2.21)*	1.61(0.95-2.72)
obese	23	15	4.52(2. 27-9.01)*	5.77(2.17-15.37)*
Self reported DM				
Yes	31	16	5.67(3.02-10.64)*	3.92(1.65-9.31)*
No	161	471	1.00	1.00
Family history of hypertension				
Yes	36	45	2.27(1.41-3.64)*	2.82(1.42-5.59)*
No	156	442	1.00	1.00
Vegetable use/week				
None	46	88	0.80(0.46-1.40)	0.70(0.30-1.65)
1-3days	112	347	0.49(0.31-0.80)*	0.55(0.26-1.18)
4-7days	34	52	1.00	1.00

*= P value < 0.05 **=18 drivers &19 farmers, (backward logistic regression out put)

6. Discussion

Hypertension is the leading risk of death globally. Raised blood pressure changes the structure of the arteries. As a result, risks of stroke, heart disease, kidney failure and other diseases increase (3, 4).

Slightly more than one in every four adults aged 35 years or older were found to be hypertensive in Gondar town (28.3%). This is a high prevalence which may be considered as a major public health problem of this community. As a result complications like disability are more likely to occur in this community particularly in those who hadn't know their hypertension status before(6).

Hypertension prevalence in this study is nearly the same to a community-based study conducted in Addis Ababa city(31.5% and 28.9% in males and females respectively)(8). It is also similar with a study done in USA where the prevalence of hypertension was 29.3%(13) . This similarity may be due to the fact that the prevalence of hypertension in this country was not well studied and got due attention but in the later i.e. USA it was already known and its prevalence is going down through treatment and life style modification.

Prevalence of hypertension in this study is considerably higher as compared to previous reports from southern Ethiopia (10.1%), Vietnam (14.1%) and Jordan (23.9%)(15, 20, 21). This discrepancy might be due to age composition differences, this study was done among those aged 35 years and older while these studies included more young age groups ranging 18 years to 25 years and were limited to below 65 years of age.. The other possible reason might be due to set up difference, this study was conducted among the urban community while the other's studies were rural based (Vietnam), may included rural community (Jordan) and included smaller towns (southern Ethiopia). Time and race differences may be other explanations.

On the other hand it is was lower than community based studies conducted in Uganda, Mozambique, Eastern Nigeria and Northern India in which the prevalence of hypertension was higher (30.5 - 44.5%)(16-18, 26). Probably this discrepancy may be attributable to higher prevalence of obesity (Nigeria, 13.3%) and may be due racial differences.

Most studies done in different part of the world agreed on the positive association between age and hypertension (15, 17, 20, 27) where hypertension was more prevalent in older age group. It is mainly associated with arterial stiffness as one gets old. According to this study age category of 55-64 years were about 2 times more likely to develop hypertension and those age category of 65 and above were about 5 times more likely to develop hypertension. On the other hand hypertension prevalence increased from age category of 55-64 years to the next category by 20%. This study also gives further evidence on the positive association of age with hypertension.

Obese people were about 6 times more likely to be hypertensive than the normal ones. Obesity was more prevalent among females but the prevalence of hypertension is more or less similar across both sexes. This finding is inline with the other's finding in community based studies done in Addis Ababa city, South West Ethiopia (Jimma university hospital), Eretria, Uganda and India where obesity was significantly associated with hypertension (8, 25-28).

Those people who had family history of hypertension were about three times at higher risk for hypertension than their counter part. This result is inline with some studies in southern Ethiopian, Jordan and Birmingham where people who had family history of hypertension were more likely to develop hypertension than those who did not have any hypertensive family member(15, 21, 22).

Those who were self reported DM cases were about 4 times more likely to develop hypertension than their counter part and 66% of DM patients were hypertensive. Probably this is due to the fact that both diseases share common risk factors and or DM is one of the complication of hypertension(4, 5).This finding is in agreement with several studies(15, 25, 28)

Unlike the other studies (16, 21, 24, 26), cigarette smoking, harmful use of alcohol, physical inactivity and excessive use of salt were not significantly associated with hypertension. However in bivariate analysis walking for at least for ten minutes continuously in day was significantly associated with hypertension. But most of those who did not walk were self reported DM cases as a result the probability of being hypertensive was more common in those DM patients, not merely the absence of walking. On the other hand risky behaviors like smoking were not common to this community and failed to show any if at all true association. In contrary to other studies excessive use of salt did not show any association. This may be due to the fact that majority of hypertensive patients (63.02 %) were advised or restricted to salt free diet.

Limitations and Strength of the study

The potential limitation of this study includes the following: First cross sectional study has inherent limitation; hypertension might have preceded some of these explanatory variables. Second this study is limited to behavioral and physical measurements, and does not include biochemical measurements like 24 hours urine sodium concentration, serum glucose level, etc. However, it is community based study and the result will be possible to generalize to the source population.

7. Conclusion

Hypertension prevalence was high and may show a hidden epidemic in this population. About one third (37%) of hypertensive patients were unaware that they had hypertension i.e. screened newly for the first time. Hypertension was common in those aged 55 years old and above.

Family history of hypertension, self reported DM, obesity and age category of 55-64 years and ≥ 65 years old were positively associated factors with hypertension.

8. Recommendation

Based on the findings of this study, the following recommendations are forwarded:

- **To policy makers**
  - Appropriate Health education policy on self control of weight through exercise and dietary management need to be designed.
  - Policy makers should design community based screening programs for hypertension especially for elderly (≥ 55 years), obese and have family history of hypertension.
- **To health workers**
  - It would be better if health extension workers early detect and refer hypertensive cases to the nearby health facilities before they come with complications.
  - Health workers need to give especial attention for those individuals who has family history of hypertension and for diabetic patients.
  - Health workers need to provide health education on early detection and timely treatment of hypertension as these are effective approach for reducing the impact of NCDs like hypertension
- **To the community**
  - The community should visit the nearby health facilities and have a regular check up for hypertension especially those who are obese, elder (≥ 55 years) and have family history of hypertension.
- **To researchers**
  - Future longitudinal studies are recommended to assess biomedical factors like DM, excessive salt intake and the effect of other factors on hypertension.

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10. Annexes

A. English version of the questionnaire

UNIVERSITY OF GONDAR

COLLEGE OF MEDICINE AND HEALTH SCIENCES

INSTITUE OF PUBLIC HEALTH

Questionnaire to asses the prevalence and associated factors of hypertension among adults of Gondar town, Northwest Ethiopia

Introduction:

My name is …….., I am working for the University of Gondar. We are interviewing adults who are living in Gondar town. The purpose of this questionnaire is to gather information on prevalence of hypertension and factors associated with hypertension. The research will be beneficial to those adults who have hypertension to provide them care and support as well as for prevention of its complications and. For non hypertensives it will be important no to have it by avoiding the risk factors that will be identified. We will ask you a series of questions which will take few minutes and then there will be measurement on your weight, height and blood pressure. Your answers to these questions will remain confidential. We will not write your name in the questionnaire. You can refuse to respond to any 8. of the questions and you can interrupt at any point in the interview.

Do you agree to participate in the study?

A. yes……. Continue with the interview

B. No……go to the next household

Thank you for being voluntary to participate in the study.

General information

01. Identification number of respondent's _____kebele_____

02. Date of interview_____/_____/_____

03. Interviewers name_____sign_____

Section 1:Socio-demographic characteristics of respondents			
S. No	Questions	Possible response	Code
101	Sex	1. Male 2. Female	
102	Age	_____years	
103	Marital status	1. Single 2. Married 3. Divorced 4. Widowed 5. Separated	
104	Educational level currently	1. Unable to read & write 2. Can read & write only 3. Primary school(1-8) 4. Secondary school(9-12) 5. University/college (12^{+})	
105	Occupation	1. Government employee 2. Merchant 3. Daily laborer 4. House wife 5. Other(specify)_____	
106	Religion	1. Orthodox Christian 2. Muslim 3. Protestant 4. Others(specify)_____	
107	Ethnicity	1. Amhara 2. Tgrie 3. Kimant 4. Others(specify)_____	
108	monthly income	_____ETB	
Section II :- Behavioral Related Questions			
201	Do you smoke cigarettes currently?	1. Yes 2. No	
202	If Yes how many cigarettes do you smoke per day?	_____number	

203	If the response is No for Q201 did you use to smoke cigarettes previously?	1. Yes 2. No	
204	If Yes for Q203 how many cigarettes did you use to smoke per day?	_____number	
205	Do you currently use alcohol (such as beer, wine, wusky or Arekie)?	*1.* Yes *2.* No	
206	When you drink alcohol, on average, how many drinks do you have during one day?	_____ bottle(s)	
207	Did you ever consume alcohol (such as beer, wine, wusky or Arekie)?	1. Yes 2. No	
208	If Yes in the past 12 months, how frequently have you had at least one drink?	1. Daily 2. 5-6/week 3. 1-4/week 4. 1-3/month 5. Less than once a month	
209	What type of **oil or fat is most often** used for meal preparation in your household?	1. Vegetable oil(saturated) 2. Butter 3. Sesame /nug oil 4. Others	
210	In a week, on how many days do you **eat fruit**?	_____days	
211	In a week, on how many days do you eat vegetables?	_____days	
212	Do you use excessive salt?	1. Yes 2. No	
213	Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like *[carrying or lifting heavy loads, digging or construction work*] for at least 10 minutes continuously?	1. Yes 2. No	
214	In a week, on how many days do you do vigorous intensity activities as part of your work	_____ days	
215	How much time do you spend doing vigorous-intensity activities at work on a typical day?	_____hours	
216	In a day, do you walk for at least 10 minutes continuously to get to and from places?	1. Yes 2. No	
217	In a week, on how many days do you walk for at least 10 minutes continuously to get to and from places?	_____no of days	

218	How much time do you spend walking for travel on a typical day?	_____hours	
219	How do you get to and from your work place usually?	1. Use vehicles 2. On foot	
220	Have you been told by a doctor or other health worker that you have raised blood pressure or hypertension?	1. Yes 2. No	
221	Are you currently receiving any treatments for raised blood pressure prescribed by a doctor or other health worker as well as any advice on (diet,exercise,stop smoking)?	1. Yes 2. No	
222	Do you have family history of hypertension?	1. Yes 2. No	
223	Have you ever been told by a doctor or other health worker that you have diabetes?	1. Yes 2. No	
224	Do you use oral contraceptives (for females)?	1. Yes 2. No	
225	If yes for how long did you use it?	_____months	
Section III:- Measurement			
301	Height	_____(CM)	
302	Weight	_____(KG)	
303	BP	Reading 1_____ Reading 2_____	

B. Amharic version of the questionnaire

በጎንደር ዩኒቨርሲቲ ህክምናና ጤና ሳይንስ ካሌጅ

የህብረተሰብ ጤና አጠባበቅ ኢንስቲቲዉት

ይህ መጠይቅ በጎንደር ከተማ የሚገኙ ዕድሜያቸው ከ35 አመትና ከዚያ በላይ የሆኑ የህብረተሰብ ክፍሎች ለደም ግፊት ያላቸዉን ተጋላጭነት እንዲሁም የደም ግፊታቸዉን ሁኔታ ለማቅ የተዘጋጀ ቃለ መጠይቅ ነው፡፡

መግቢያ

ሰላም፡- እንደምን አሉ _____ እባላለሁ፡፡ለጎንደር ዩኒቨረስቲ እየሰራሁ እገኛለሁ እዚህ የመጣሁት ይህንን ጥናት የሚይካሂደው የጎንደር ዩኒቨርሲቲ የህበረተሰብ ጤና ክፊል ቡድን አባል ሆኘ ነው፡፡ ከዚህ በመቀጠል ለደም ግፊት ያላቸዉን ተጋላጭነት እንዲሁም የደም ግፊታቸዉን ሁኔታ በተመለከተ የተወሰኑ ጥያቄዎችን ለመጠይቅ እና የደም ግፊተዎን፣ ክብደተዎን እና ቁመተዎን ለመለካት እዋዳለሁ፡፡ ከእርስዎ የሚገኘው መረጃ የደም ግፊት አገልግሎትን ለማሻሻልና ችግሩን ቀድሞ ለመከላከል ከፍተኛ እገዛ ይኖረዋል፡፡

ከእርስዎ የምናገኘውን ማንኛውንም መረጃ በሚስጥር እንጠብቃለን፡፡ ከዚህ ጥናት ጋር በተያያዘ በማንኛውም ቦታ እና ጊዜ ስምዎ እንደማይመዘገብና እንደማይጠቀስም ልንገልጽልዎ እንወዳለን፡፡

ለጥናቱ የምናሳትፈዎ የእርስዎን ሙሉ ፈቃደኝነት ስናገኝ ብቻ ነው፡፡ በመጠይቁ ላለመሳተፍ ወይም በመጠይቁ ሂደት ሊመልሱት የማይፈልጉትን ጥያቄዎች ያለመመለስ መብትዎ የተጠበቀ ነው፡፡

በመጠይቁ ለመሳተፍ ፈቃደኛ ነዎት?

1. **አዎ ፈቃደኛ ነኝ _____ መጠይቁ ይቀጥላል**
2. **የለም ፈቃደኛ አይደለሁም ወደ ሌላ ተሳታፊ ቤት እለፍ**

አመሰግናለሁ

አጠቃላይ መረጃ

01. መለያ ቁጥር _____ቀበሌ_____
02. መጠይቁ የተካሄደበት ቀን_____/_____/_____
03. የመረጃ ሰብሳቢው ስም_____ ፊርማ_____

ክፍል 1 ማህበራዊ እና ስነ-ህዝባዊ መረጃ :		
101	ጸታ	1. ወንድ 2. ሴት
102	እድሜ	3. _____ አመት
103	የጋብቻ ሁኔታ	6. ያላገባ/ች 7. ያገባ/ች 8. የፈታ/ች 9. የሞተበት/ባት 10. ተለያዩተዉ የሚኖሩ
104	የትምህርት ደረጃ(አሁን)	1. ማንበብና መጻፍ የማይችሉ 2. ማንበብና መጻፍ ብቻ የሚይችሉ 3. የመጀመሪያ ደረጃ (1-8) 4. ሁለተኛ ደረጃ (9-12) 5. ከሁለተኛ ደረጃ በላይ
105	ስራ	6. የመንግስት ሰራተኛ 7. ነጋዴ 8. የቀን ሰራተኛ 9. የቤት እመቤት 10. ሌላ(ይገለጽ)_____
106	ሃይማኖት	1. ኦርቶዶክስ ክርስቲያን 2. ሙስሊም 3. ፕሮቴስታንት 4. ሌላ_____
107	ወርሀዊ ገቢ	_____ በብር
108	ብሄር	1. አማራ 2. ትግሬ 3. ቅማንት 4. ሌላ(ይገለጽ)_____
ክፍል 11 :ከስነ-ባህሪ ጋር የተያያዙ ጥያቄወች		
201	በአሁኑ ሰአት ሲጋራ ያጨሳሉ?	1. አዎ 2. አላጨስም
202	አዎ ካሉ በቀን ምን ያህል ሲጋራ ያጨሳሉ?	_____ በቁጥር
203	አላጨስም ካሉ ከዚህ በፊትስ አጭሰዉ ያዉቃሉ?	1. አዎ 2. አላዉቅም
204	ለጥያቄ ቁጥር 203 መልሰዎ አዎ ከሆነ በቀን ሥንት ሲጋራ ያጨሱ ነበር?	_____በቁጥር
205	ባሁኑ ሰአት እንደ ቢራ ፣ወይን ፣ዊስኪ፣ አረቂ የመሳሰሉ የአልኮል መጠጦችን	1. አዎ 2. አልጠጣም

	ይጠጣሉ?	
206	አልኮል በሚጠጡበት ጊዜ ባአማካኝ ምን ያህል በአንዴ ይጠጣሉ?	_____በጠርሙስ
207	ከዚህ በፊትስ አልኮል(እንደ ቢራ ፣ወይን ፣ዊስኪ፣ አረቂ የመሳሰሉትን) ጠጥተዉ ያዉቃሉ?	1. አዎ 2. አላዉቅም
208	አዎ ካሉ ባለፉት 12 ወራት ዉስጥ ቢያንስ አንድ ጊዜ ምን ያክል ጊዜ ጠጥተዋል?	1. በየቀኑ 2. 5-6/በሳምንት 3. 1-4/በሳምንት 4. 1-3/በወር 5. በወር ከአንድ ጊዜ በታች
209	በአብዛኛዉ ለቤተሰብ ምግብ ዝግጅት ምን አይነት ዘይት ወይንም ቅባት ይጠቀማሉ?	1. የሚረጋ ዘይት 2. ቅቤ 3. የሰሊጥ/የኑግ ዘይት 4. ሌላ
210	በሳምንት ዉስጥ ለምን ያክል ቀናት ፍራፍሬ ይመገባሉ?	_____በቀን
211	በሳምንት ዉስጥ ለምን ያክል ቀናት አትክልት ያለዉ ምግብ ይጠቀማሉ?	_____በቀን
212	ጨዉ በብዛት ይጠቀማሉ?	1. አዎ 2. አልጠቀምም
213	የልብ ምተዎ ወይንም የአተነፋፈስ ሁኔታዎ እንዲጨምር የሚያደርግ ከባድ ስራ(ከባድ እቃ መሸከም፣መቆፈር፣ግንባታ ስራ ወዘተ) ቢያንስ ለ10 ተከታታይ ደቂቃዎች ይሰራሉ?	1. አዎ 2. አልሰራም
214	በሳምንት ዉስጥ ለምን ያክል ቀናት ከባድ ስራ እየሰሩ ያሳልፋሉ?	_____በቀን
215	በቀን ዉስጥ ለምን ያክል ሰአት ከባድ ስራ እየሰሩ ያሳልፋሉ?	_____በሰአት
216	በቀን ቢያንስ ለ10 ደቂቃ በተከታታይ ከቦታ ቦታ ለመሄድ እና ለመምጣት የእግር ጉዞ ያደርጋሉ?	1. አወ 2. አላደርግም
217	በሳምንት ዉስጥ በያንስ ለ10 ተከታታይ ደቂቃዎች ስንት ቀን በእግር ከቦታ ቦታ እንቅስቃሴ/ጉዞ ያደርጋሉ?	_____በቀን
218	በቀን ለምን ያክል ጊዜ በእግር እንቅስቃሴ ያደርጋሉ?	_____በሰአት
219	በአብዛኛዉ እንዴት ነዉ ወደ ስራ ቦታ የሚሄዱትእና የሚመጡት?	1. በተሽከርካሪ 2. በእግር
220	የደም ግፊት መጨመር በሽታ አለበት ተብለዉ በሀኪም ወይም በሌላ የጤና	1. አዎ

	ባለሙያ ተነግሮዎት ያዉቃል?	2. የለም
221	ለደም ግፊት መጨመር ተብሎ በሀኪም ወይም በሌላ የጤና ባለሙያ የታዘዘ የሚወስዱት መድሀኒት ወይንም ምክር(እንደ ምግብ ፣እንቅስቃሴ፣ ከማጨስ መቆጠብ) አለ?	1. አዎ 2. የለም
222	ከቤተሰብዎ መካከል የደም ግፊት ያለበት ሰዉ አለ?	1. አዎ 2. የለም
223	የስኳር በሽታ አለብዎት ተብለዉ በሀኪም ወይም በሌላ የጤና ባለሙያ ተነግሮዎት ያዉቃል?	1. አዎ 2. የለም
224		3.
225	በአፍ የሚወሰድ(ታብሌት)የወሊድ መቆጣጠሪያ ይጠቀማሉ(ለሴቶች)?	1. አዎ 2. አልጠቀምም
226	አዎ ካሉ ለምን ያክል ጊዜ ተጠቅመዋል?	_____በወር
	ክፍል 3፡- ስነ- ልኬታ	
301	ቁመት	_____በሴ.ሜ
302	ክብደት	_____በኪ.ግ
304	የደም ግፊት	ንባብ 1 _____ ንባብ 2 _____

C. **Information Sheet and Consent Form**

Title of the Research Project

Assessment of Prevalence and Associated Factors of Hypertension in the Adult Population of Gondar town, North West Ethiopia

Name of principal investigator_____ Akilew Awoke Adane

Name of the Organization_____ University of Gondar, institute of Public Health

Name of the Sponsor_____ University of Gondar, and chronic diseases project

Information sheet and consent Form prepared for adults in Gondar town, in Research Project that Assessed the Prevalence and Associated Factors of Hypertension in the Adult of Gondar town, North West Ethiopia.

Introduction

This Information sheet and consent form was prepared with the aim of explaining the research project that you are asked to join by a group of research investigators. The main aim of the research project was to assess the Prevalence and Associated Factors of Hypertension among Adult of Gondar town. The investigators include final year MPH graduate student from the institute of Public Health, College of Medicine and Health Science, University of Gondar and two advisors from the University staff.

Purpose of the Research Project:

The aim of this study was to assess the prevalence of hypertension and to identify associated factors with it in adults of Gondar town to provide baseline data to improve and strengthen the prevention and curative services.

Procedure:

In order to assess the magnitude of hypertension and associated factors in adults we invite you to take part in our project. If you are willing to participate in our project you need to understand and sign the consent form. Then you will be requested to give your response to the data collectors and subjected for some measurements.

For this questionnaire based study, participants were samples of adults whose age is 35 and above and lived in the study area for at least six months.

Risk or harm:

By participating in this research project you will not feel any harm or discomfort. But we may waist about 20 minutes for data collection. When comparing time waist to benefits of prevention of hypertension it will be of immense importance to participate in this research project.

Benefits:

If you participate in this research project there may be some direct benefits like information about your BP status, how to control or prevent your BP and even referral to the health facilities if you are unfortunately found to be sever hypertensive. But your participation is likely to help us in assessing the extent of hypertension and factors associated with it in adults. Furthermore, the information obtained from you will be used for planning and implementation of hypertension prevention and control programs. However you will not be provided any incentives or payment to take part in this project

Confidentiality:

The information collected from this research project will be kept in confidential. Information collected about you will be stored in a file which will not have your name on it but a code number assigned to it and will be kept in a locked cabinet so that no one except the investigator will have access to it.

Right to Refuse or Withdraw:

You have the full right to refuse from participating in this research (you can choose not to respond all or some of the questions) if you don't wish to participate and this will not affect you. You have also the full right to withdraw from this study at any time you wish with out any penalty.

Persons to contact:

This research project was reviewed and approved by the ethical committee of the University of Gondar. If you have any question, you can contact one or both of the following individuals at any time.

1. Akilew Awoke, University of Gondar, institute of Public Health.
   Tel – 0918035392
   Email- akilew24@gmail.com
2. Dr. Berihun Megabiaw (MD, MPH) institute of public health, CMHS University of Gondar
   Tel – 0912127173
   E-mail- beredomega@yahoo.com
3. Tadesse Awoke(BSc, MSc)
   E-mail- t_awoke@yahoo.com

CONSENT FORM

I the undersigned have been informed that the interview is conducted to gather information about prevalence and associated factors of hypertension among adults in Gondar Town. The result of the study will help hypertensive patients, the government, and health facilities involved in hypertensive care and prevention. I also agreed about the confidentiality of the responses to be at a highest possible level.

Signature of participant: _____.

Date: _____.

Name and signature of data collector: _____.

ምርምር የማድረጊያ ፈቃድ ለመውሰድ የተዘጋጀ ማብራሪያ:-

በሰሜን ምዕራብ ኢትዮጵያ በጎንደር ከተማ ነዋሪዎችና እድሜያቸዉ 35 አመት እና ከዚያ በላይ የሆናቸዉ የማህበረሰብ ክፍሎችን የደም ግፊት ሁኔታ እና ተያያዥ ምክኒያቶችን ለማጥናት የተካሄደ ጥናት ነበር::

ዋና ተመራማሪ:- ::አቅለዉ አወቀ አዳነ

አድራሻ:- ጎንደር ዩኒቨርሲቲ ሕክምናና ጤና ሳይንስ ኮሌጅ : የሕብረተሰብ ጤና አጠባበቅ ኢንስቲቲዉት

ስልክ ቁጥር:- 0918035392

ኢሜይል -akilew24@gmail.com

አማካሪዎች :- ዶ/ር በሪሁን መጋቢያ

አድራሻ:- ጎንደር ዩኒቨርሲቲ ሕክምናና ጤና ሳይንስ ኮሌጅ : የሕብረተሰብ ጤና አጠባበቅ ኢንስቲቲዉት

ስልክ ቁጥር:-0912127173

ኢሜይል -beredomega@gmail..com

አቶ ታደሰ አወቀ

አድራሻ:- ጎንደር ዩኒቨርሲቲ ሕክምናና ጤና ሳይንስ ኮሌጅ : የሕብረተሰብ ጤና አጠባበቅ ኢንስቲቲዉት

ስልክ ቁጥር:-0910173308

ኢሜይል t_awoke@gmail..com

መግቢያ:-

ይህ በሰሜን ምዕራብ ኢትዮጵያ በጎንደር ከተማ ነዋሪዎችና እድሜያቸዉ 35 አመት እና ከዚያ በላይ የሆናቸዉ የማህበረሰብ ክፍሎች የደም ግፊት ሁኔታ እና ተያያዥ ምክኒያቶችን ለማጥናት የተካሄደ ጥናት ሲሆን በጎንደር ዩኒቨርሲቲ ሕክምናና ጤና ሳይንስ ኮሌጅ በሕብረተሰብ ጤና አጠባበቅ ኢንስቲቲዉት የመጨረሻ ዓመት የሁለተኛ ዲግሪ ተማሪ በሆነው አቅለዉ አወቀ አዳነ እና በአማካሪዎቹ በዶ/ር በሪሁን መጋቢያዉ እና በአቶ ታደሰ አወቀ የሚካሄድ ነው ። ዓላማውም በከተማችን ያለ የህብረተሰብ ክፍሎች የደም ግፊት ሁኔታ እና ተዛማጅ ምክኒያቶችን ለማጥናት ነበር :

የጥናቱ ዓላማ:-

የደም ግፊት ሁኔታ ምን ያህል እንደሆነና ተያየዥ ምክኒያቶቹም ምን ምን እንደሆኑ ለማወቅ የተካሄደ ጥናት ነበር:

<u>የጥናቱ አካሄድ:</u>

ይህ ጥናት የሚካሄደው የደም ግፊት ሁኔታ ምን ያህል እንደሆነና ተያየኝር ምክኒያቶቹም ምን ምን እንደሆኑ ለማወቅ እንደመሆኑ መጠን እርስዎም የበኩልዎን አስተዋፅየ እንዲያደርጉ በትሕትና እንጋብዛለን:: ዓላማውን ተገንዝበው ለመሣተፍ ፈቃደኛ ከሆኑ የተዘጋጀውን የስምምነት ውል ይፈርሙና ጥያቄዎችን በመመለስ የበኩልዎን አስተዋፅየ ያድርጉልን::

<u>በጥናቱ የመሳተፍ ጉዳት:-</u>

በዚህ ጥናት በመሳተፍ ሊጎዱ ወይንም ሊያባክኑ የሚችሉት ነገር ቢኖር ምናልባትም ይህንን የመረጃ መሰብሰቢያ መጠይቅ በመመለስ የሚያባክኑት ሐያ ያህል ደቂቃ ጊዜ ብቻ ነው:: ይህም ቢሆን ጥናቱ ለወደፊቱ ከሚያስገኘው ጠቀሜታ አንፃር እና እርስዎም በሚያጠፉት ጊዜ እና በሚሠጡት መረጃ ብዙ ችግር እንደማይፈጥርብዎ እንገምታለን::

<u>የጥናቱ ጠቀሜታ:-</u>

በዚህ ጥናት በመሳተፍ እርስዎ በቀጥታ ተጠቃሚ ከመሆንዉም (ለምሳሌ የደም ግፊት ሁኔተዎን ያዉቃሉ፣የምክር አገልግሎት ያገኛሉ እንዲሁም የደም ግፊተዎ በጣም ጨምሮ ከተገኘ ወደ ጤና ተቛም ሪፈር ይደረጋሉ) በሻገር በጥናቱ ዉጤት እርሰዎ ና ቤተሰቦቻቸው ወደፊት ተጠቃሚ እንደሚሆኑ አያጠያይቅም:: ስለዚህ በዚህ ጥናት ቢሳተፉ ጠቀሜታው የጎላ ይሆናል::

<u>hየመረጃ ምስጢራዊነት:-</u>

ለዚህ ጥናት ሰኬታማነት የሚሰጡት ማንኛውም መረጃ ምስጢራዊነቱ የተጠበቀና ስምዎትም የማይፃፍ ከመሆኑም ባሻገር መልስ የሰጡበትም ወረቀት የራሱ ኮድ ተሰጥቶትና ተቆልፎ የሚቀመጥ ነው::

<u>ያለመሳተፍ መብት:-</u>

በዚህ ጥናት አለመሳተፍ ወይንም በማንኛውም ጊዜና ሁኔታ ማቃረጥም ሆነ ለአንዳንድ ጥያቄዎች መልስ አለመስጠት ይቻላሉ:: ለመሳተፍ ፋቃደኛ ባለመሆንዎም ምንም አይነት ተጽእኖ እንደማይደርስበዎ ልናረጋግጥልዎ እንወዳለን::

<u>ለበለጠ መረጃ:-</u>

ይህ ጥናት በጎንደር ዩኒቨርሲቲ የጥናትና ምርምር ኮሚቴ ተመርምሮ ይፀድቃል ስለዚህ ጥናት ያለዎትን ማንኛውንም ጥያቄ ዋና ተመራማሪውን አቅለዉ አወቀን በስልክ ቁጥር 0918035392 ወይንም በኢ-ሜይል akilew24@gmail.com ወይንም አማካሪውን ዶ/ር በሪሁን መጋቢያውን በስልክ ቁጥር 09-12-12-71-73 ወይንም በኢሜይል -beredomega@gmail.com በማንኛውም ጊዜና ሁኔታ መጠየቅ ይችላሉ::

ስምምነት:-

ይህ ጥናት የአዋቂዎችን የደም ግፊት መጠንን እና ተያያዥ ምክኒያቶችን ለማጥናት እንደሆነና የጥናቱ ውጤትም በሽታዉን ቀድሞ ለመከላከል እና ተገቢዉን ህክምና ለመስጠት እንደሚጠቅም ተገንዝቤ ::

የምሠጠው መረጃም በሚስጥር እንደሚያዝ ተገልያልኝ ተስማምቻለሁ ::

የተሳታፊው ፊርማ:- _____

ቀን: _____

የመረጃ ሰብሳቢው ፊርማ:- _____

DECLARATION

I, the undersigned, senior MPH student declare that this thesis is my original work in partial fulfillment of the requirement for the degree of Master of Public Health.

Name: Akilew Awoke Adane

Signature: _____

Place of submission: institute of Public Health, College of Medicine and Health Sciences, University of Gondar.

Date of Submission: _____

This thesis work has been submitted for examination with my/our approval as University advisor(s).

Advisors

Name	**Signature**
Dr. Berihun Megabiaw	_____
Mr. Tadesse Awoke	_____